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R17

Code No: 5421AN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech II Semester Examinations, June/July - 2018

REFRIGERATION AND AIR CONDITIONING

(Thermal Engineering)

Time: 3hrs

Max.Marks:75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

5 × 5 Marks = 25

1. a) State the analysis of Standard Vapour compression Refrigeration System. [5]
- b) Discuss about the enthalpy-temperature-concentration chart. [5]
- c) Explain the basic principle of pulse tube. [5]
- d) Explain the contact factor. [5]
- e) Explain unitary refrigerant based systems. [5]

PART - B

5 × 10 Marks = 50

2. Explain the procedure involved in the design of capillary tube. [10]

OR

3. Analyze and perform the cyclic calculations for Carnot refrigeration cycle. [10]

4. Differentiate between water-lithium bromide and ammonia-water systems vis-à-vis their properties. [10]

OR

5. Analyze basic steady flow processes using ammonia-water mixtures as adiabatic and non-adiabatic mixing. [10]

6. Explain the working details along with principle of steam jet refrigeration system with a line diagram. [10]

OR

7. Explain the working principle of regenerative refrigeration system with a line sketch. [10]

8. Explain the estimation of cooling load in an air conditioning system. [10]

OR

9. The operating temperatures of a single stage vapour absorption refrigeration system are: generator: 90°C; condenser and absorber: 40°C; evaporator: 0°C. The system has a refrigeration capacity of 100 kW and the heat input to the system is 160 kW. The solution pump work is negligible.

a) Find the COP of the system and the total heat rejection rate from the system.

b) An inventor claims that by improving the design of all the components of the system he could reduce the heat input to the system to 80 kW while keeping the refrigeration capacity and operating temperatures same as before. Examine the validity of the claim.

[5+5]

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10. Explain the function of a thermal distribution system in air conditioning. [10]

OR

11. Explain the working principle, advantages, disadvantages and applications of air-water systems. [10]

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